



## Updating the ATOVS and AVHRR Pre-processing Package (AAPP) for future Polar-orbiting Satellites

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Description of AAPP

Applications of AAPP

Updating AAPP for future satellites

# What is AAPP?



- Pre-processing package for polar orbiter data
- Maintained by **EUMETSAT Satellite Applications Facility for Numerical Weather Prediction (NWP-SAF)**
- Lead institute - Met Office
- ~200 licensed users worldwide
- Runs on a range of Unix and Linux computer platforms



## Satellites

- NOAA-15, 16, 17 (current AAPP version 4.4)
- NOAA-N, N' (AAPP v5 in preparation)
- METOP (launch April 2006 – AAPP v6)
- Pre-NOAA15 HRPT

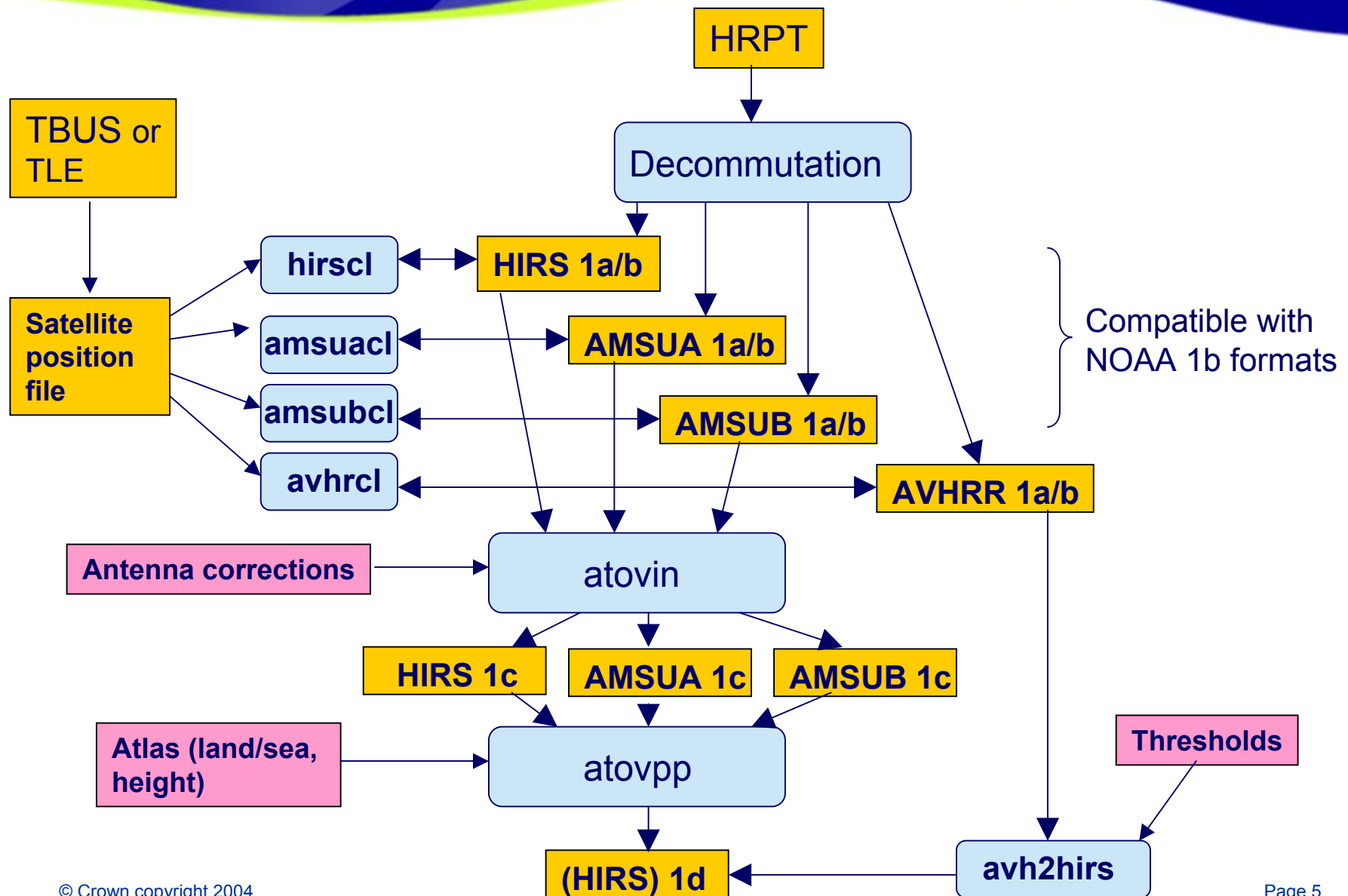
## Instruments

- AMSU-A, AMSU-B, HIRS, AVHRR, (MSU)
- MHS (AAPP v5)
- IASI (AAPP v6)

## Data inputs

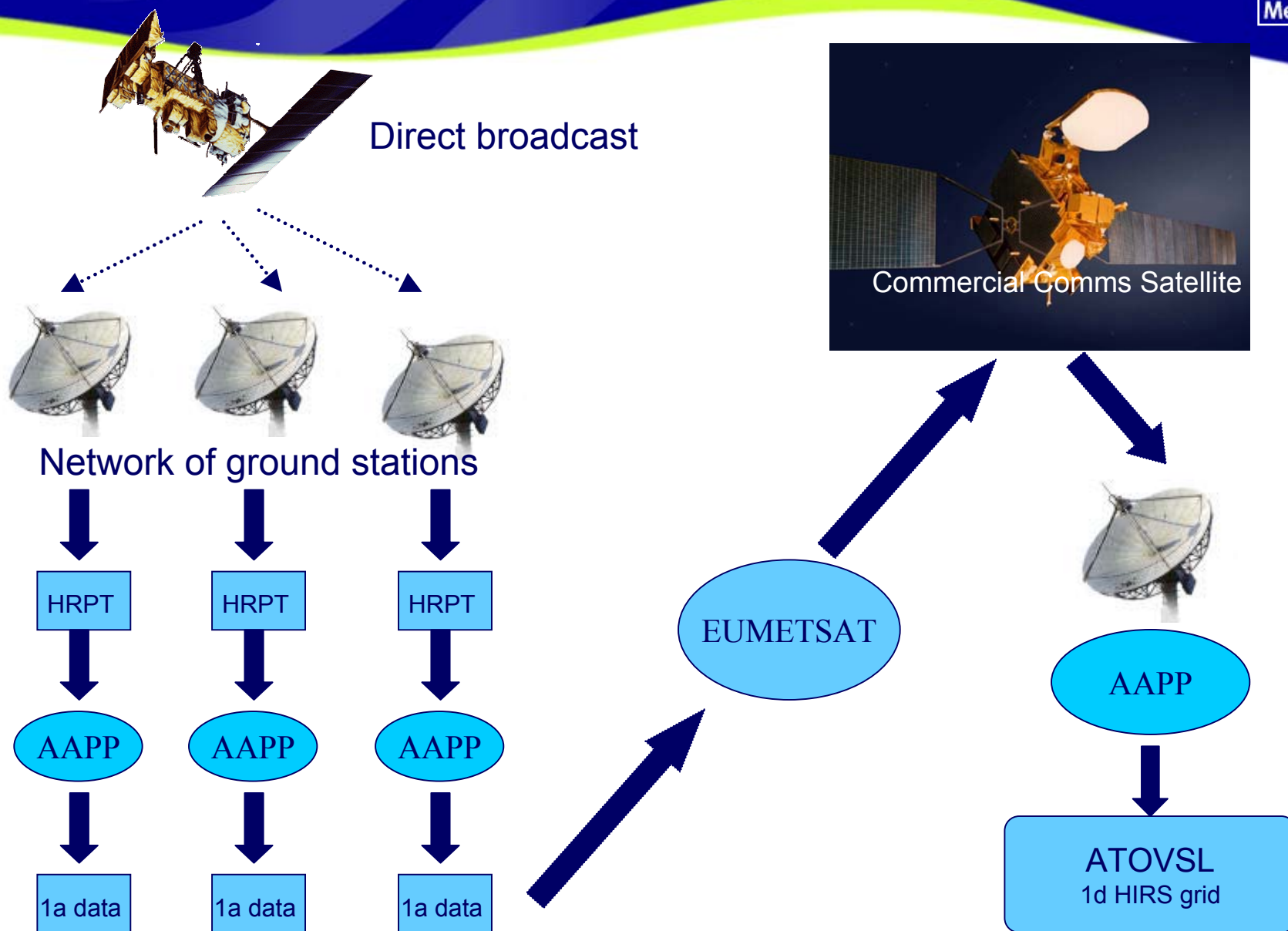
- HRPT
- NESDIS 1b archives (NOAA-15 and later)
- EARS (EUMETSAT ATOVS Retransmission Service) 1a or 1c

# AAPP structure



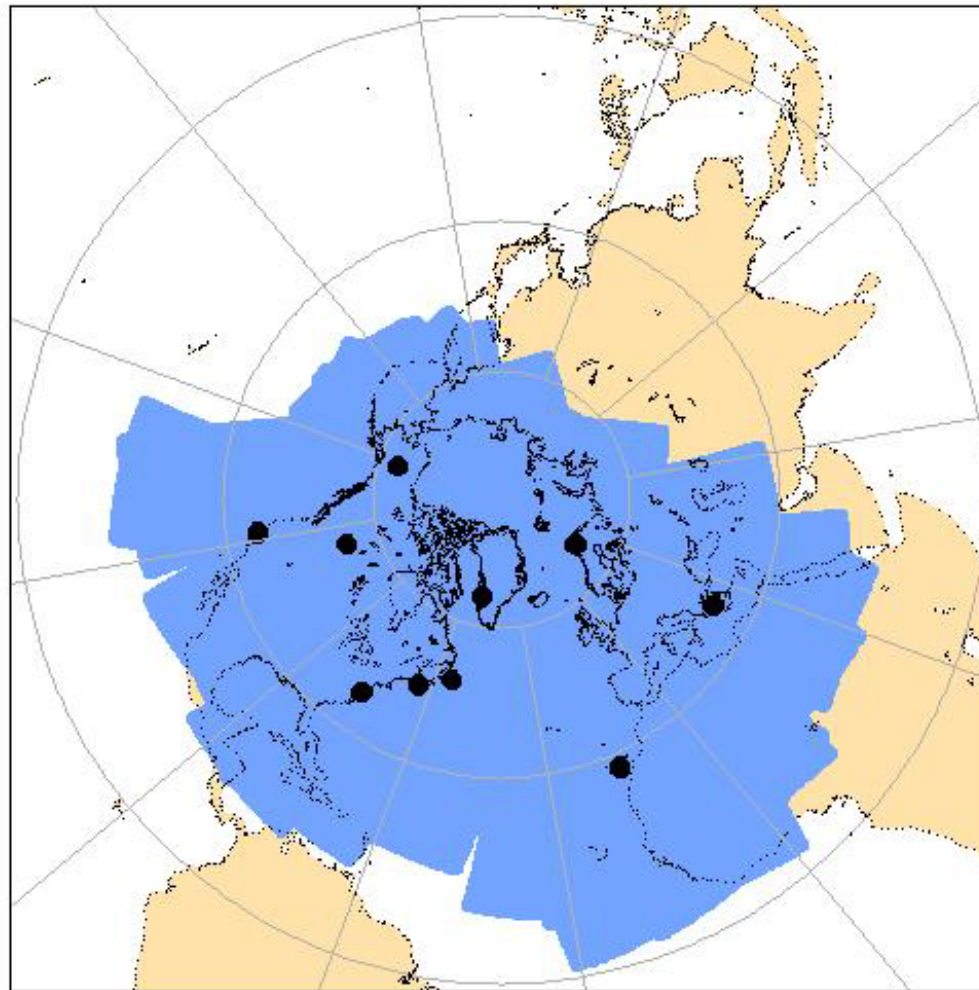
- Use within EARS system
- Pre-processor for Numerical Weather Prediction
- Imagery for forecasters

# EARS system



Black: current ground stations

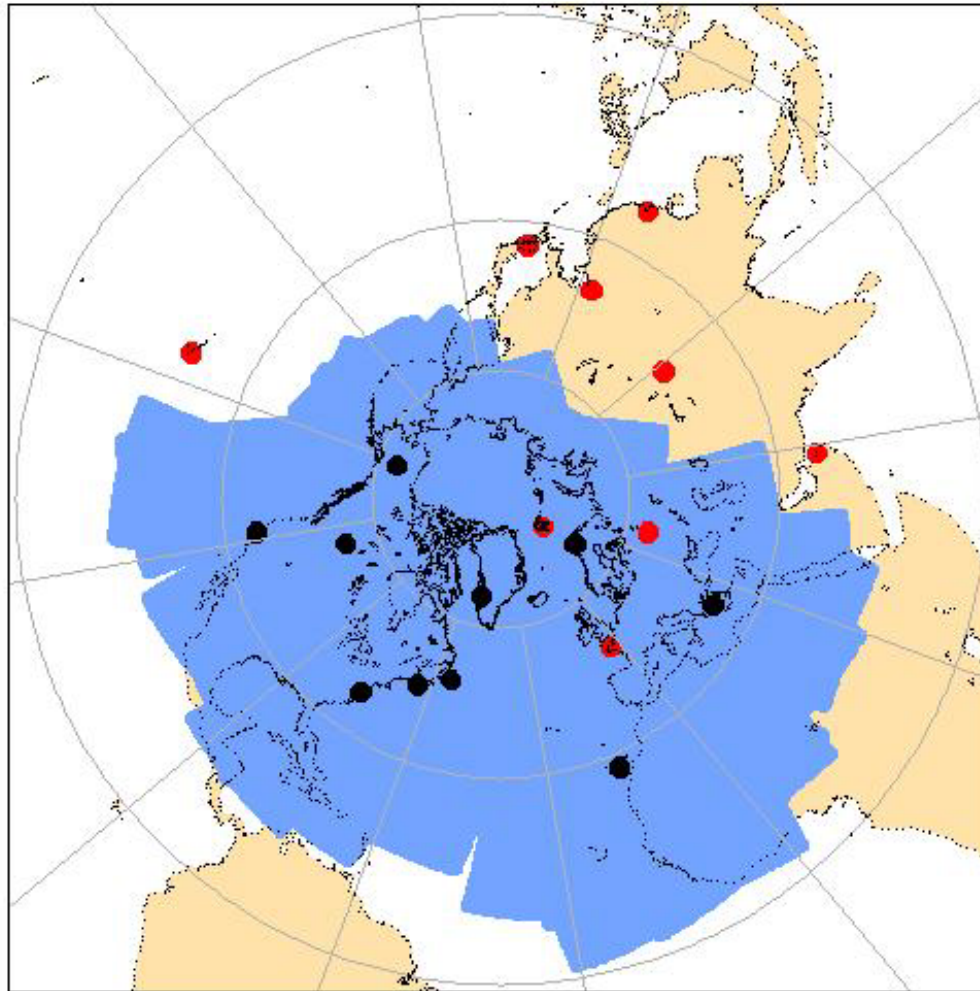
24 hours of  
data





Black: current ground stations Red: proposed extension

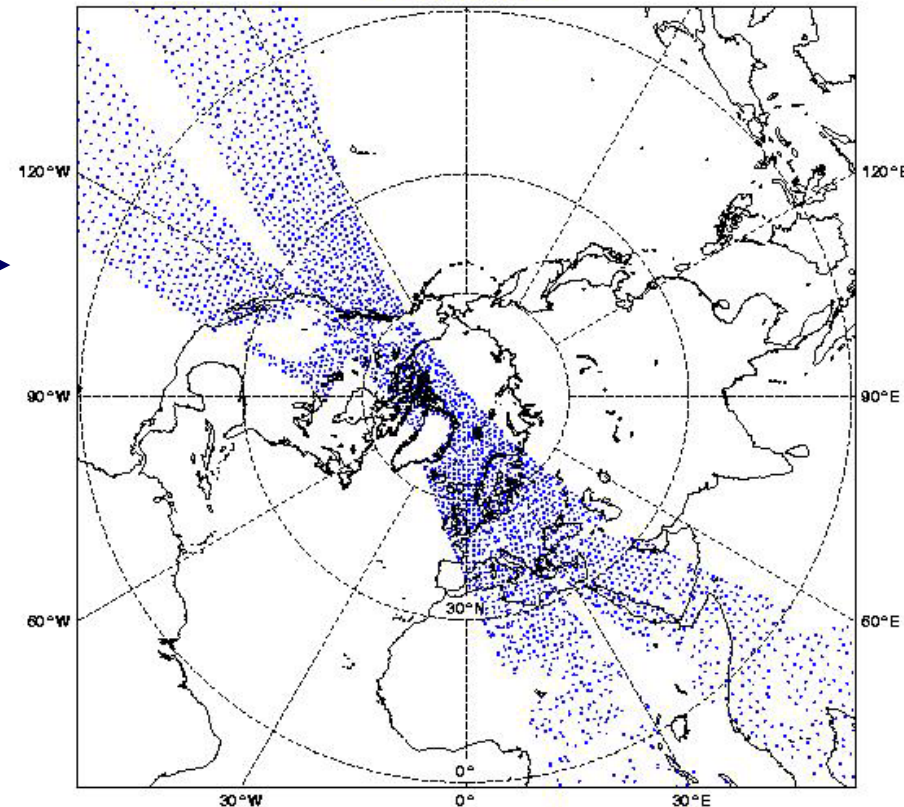
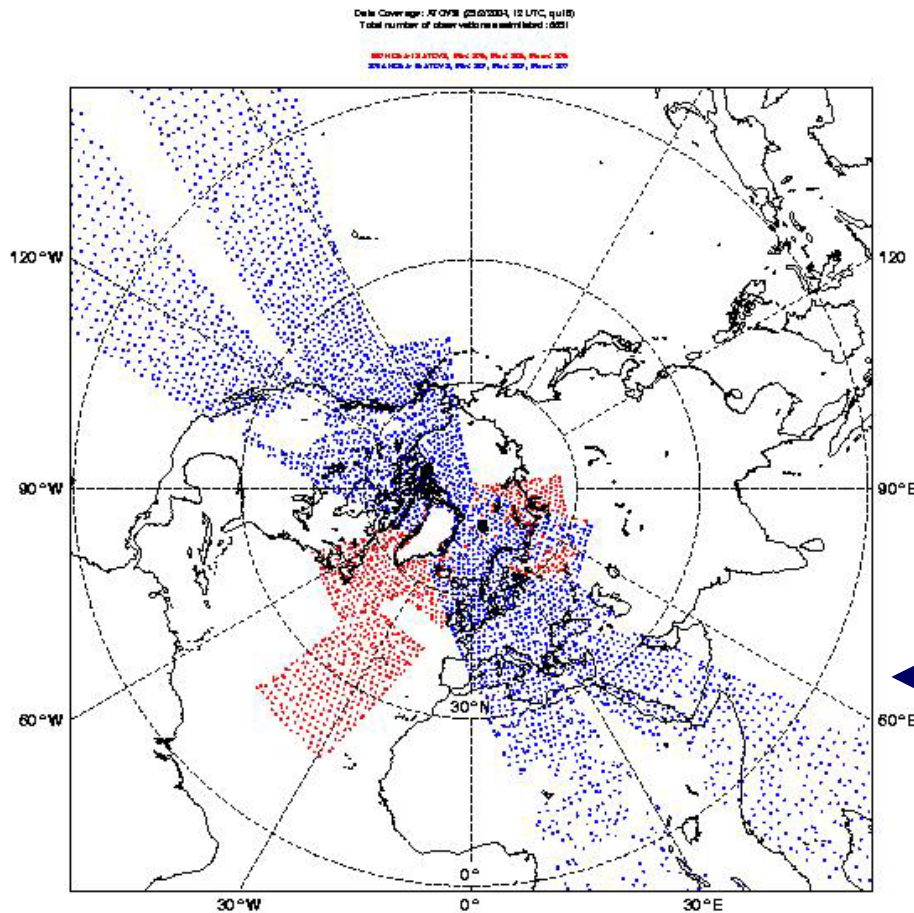
24 hours of  
data



- For global model, forecast run starts 1hr 45 min after *center* of 6 hour assimilation window
- Typically <50% of Global data arrives by then – and often no NOAA-15
- But ~75% of EARS (max delay 30 minutes)
- Therefore we maximise data usage by assimilating
  - Global NESDIS
  - EARS for Tromsø (Norway), Maspalomas (Canaries), Edmonton (Canada).
  - Local HRPT in UK mesoscale model. *New HRPT station at Exeter (replaced West Freugh, Scotland – 1<sup>st</sup> Dec 2004)*
- Also AIRS and AMSU-A on Aqua satellite

# Example of extra data

Global data assimilated  
In main run



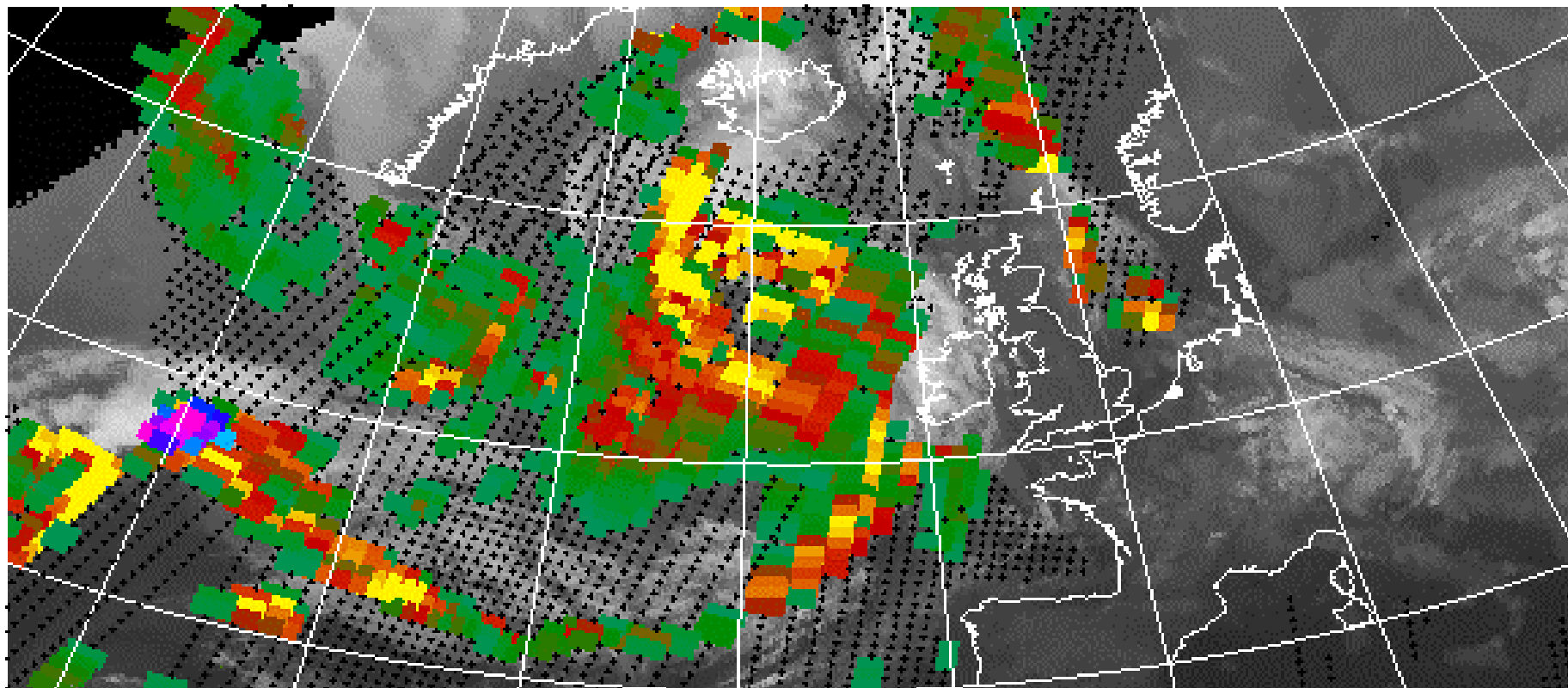
Blue = NOAA-16

Red = NOAA-15



EARS and Global data  
assimilated in main run

# Imagery from ATOVS level 1d



1 Oct 2004, 1500

AMSU-A grid

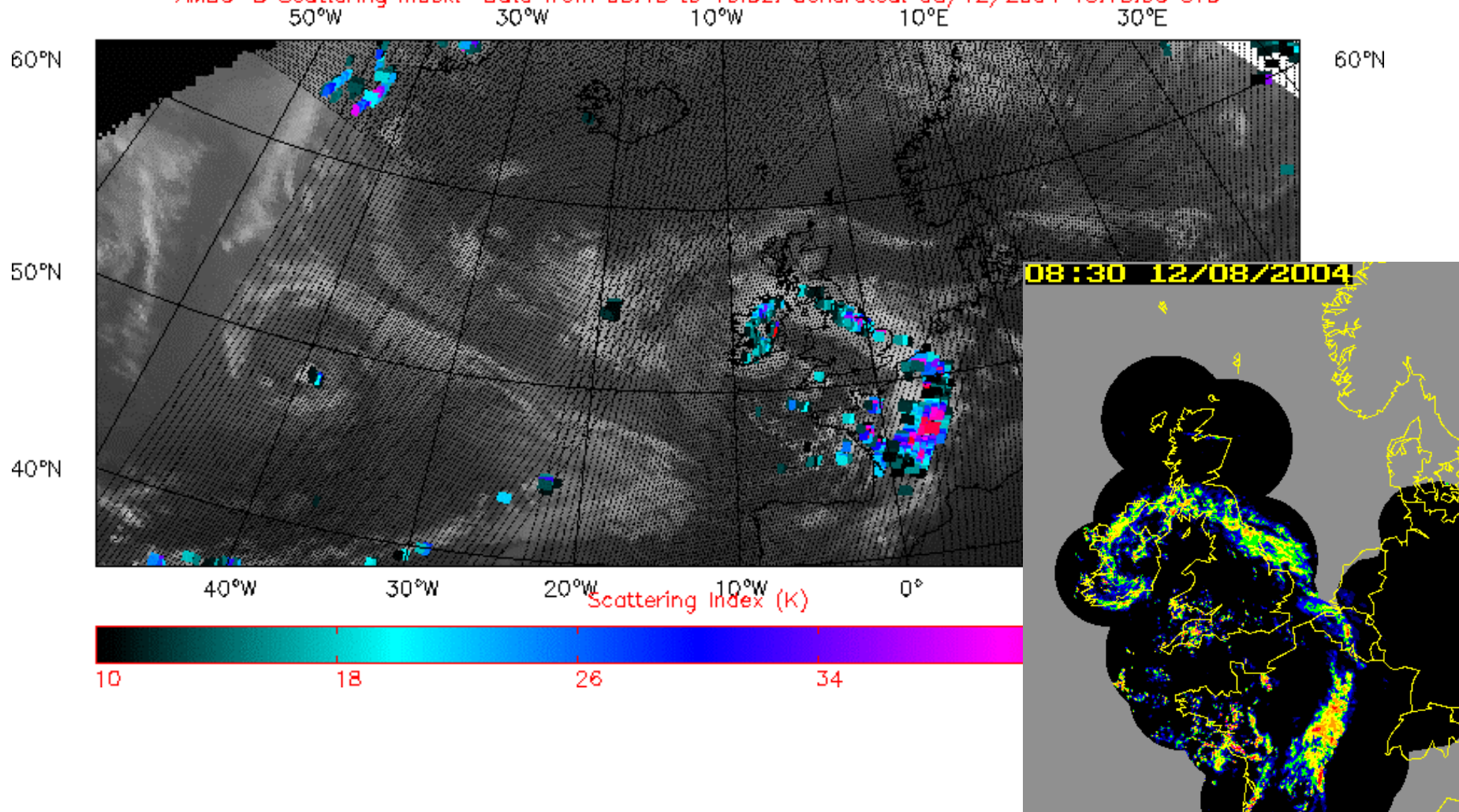
**AMSU-A**  
Liquid cloud

**AMSU-B**  
Scattering



# AMSU-B scattering index

AMSU-B Scattering Index. Data from 05:48 to 10:52. Generated: 08/12/2004 13:15:06 UTC



12 Aug 2004, 0600-1100

AMSU-B grid

- Installed Nov 2004
- Supplied by Kongsberg Spacetec (Norway)
- Receives
  - 5 NOAA (12,14,15,16,17)
  - MODIS on Terra + Aqua
  - FY-1D
- METOP compatible
- Possibly Windsat??



KONGSBERG

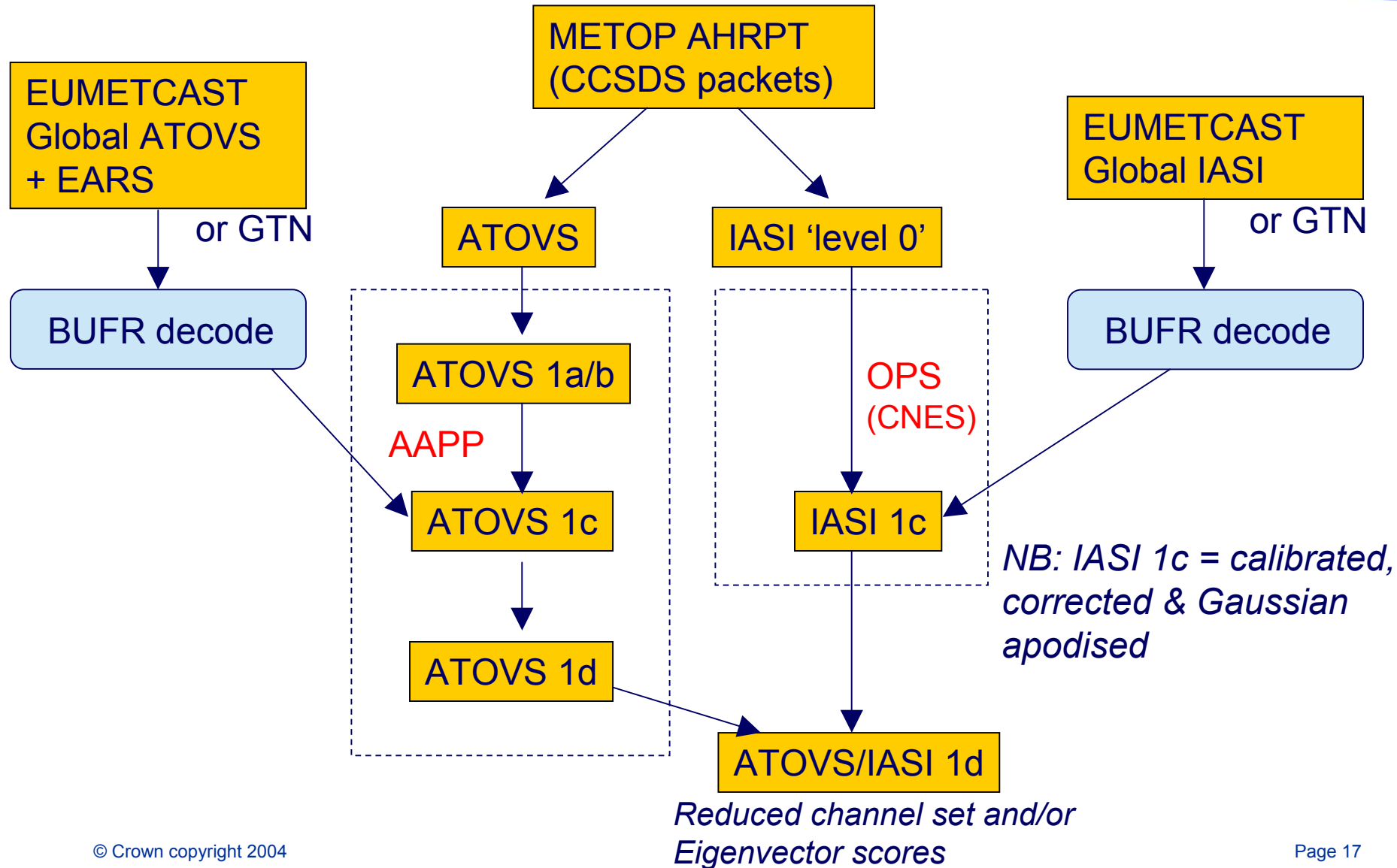








# AAPP Developments - METOP



## ■ NPP and NPOESS

- AAPP development effort will concentrate on METOP, but would like to process NPP
- New instruments – CrIS, ATMS, VIIRS
- Will there be direct broadcast for NPP? If so, can we receive it?
- Need to define formats ASAP – e.g. level 1b. NB: Launch (“early 2006”) may be close to that of METOP
- NPP orbit is 1030 (c.f. METOP 0930)

- AAPP is used worldwide to pre-process direct-readout polar orbiter data
- Freely available – see <http://www.metoffice.com/research/interproj/nwpsaf/deliverables.html>
- Version 5 will be released soon after launch of NOAA-N
- Preparations well underway for METOP-compatible version, including IASI
- Plan to extend for NPP and NPOESS – but need detailed information on instruments and formats as soon as possible